



Noble Thumb Wind Project

Status and Experiences

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Wind Power...the natural choice

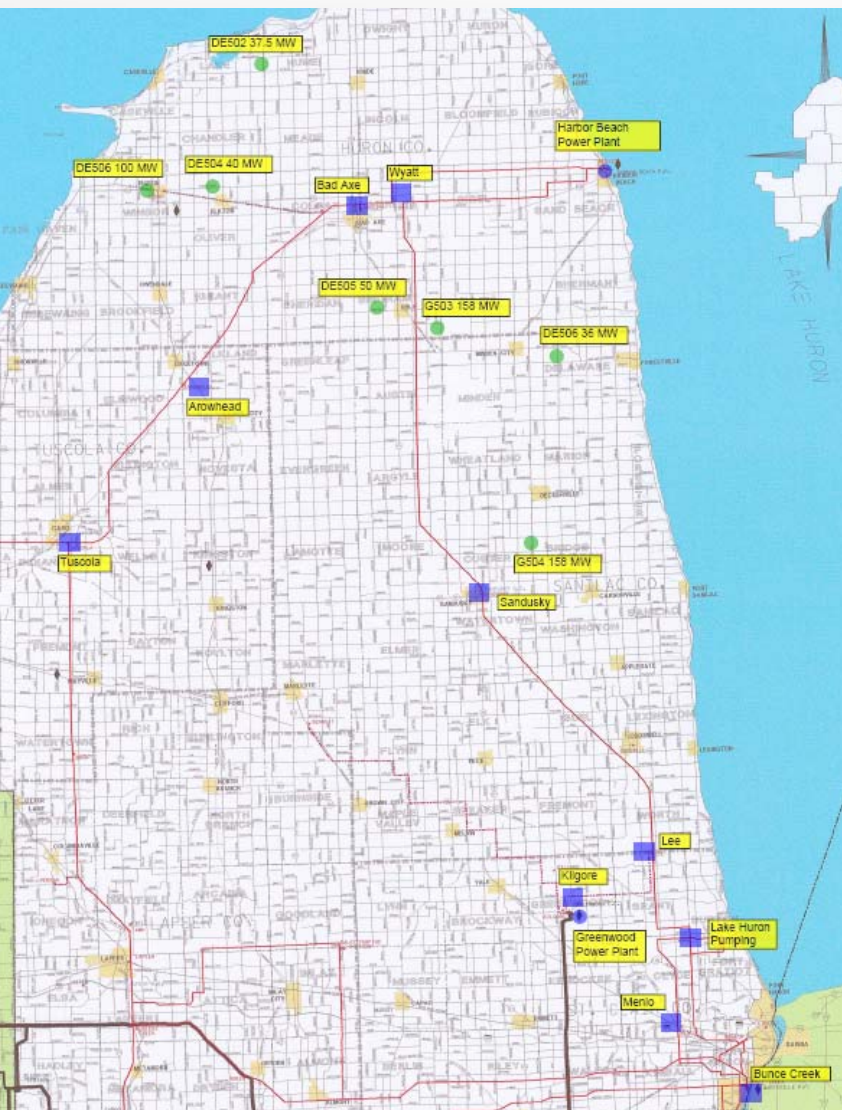
Status

- **Power Sales Agreements**
 - Consumers Energy
 - Noble Contract - 150,000 GWH/yr
 - Mackinaw Power – 31,000 GWH/yr
- **Interconnection**
 - MISO G503 158 MW –
 - 80 MW capability to be installed 2007
- **Land**
 - >25,000 acres in 8 townships
- **Permits**
 - Zoning ordinances established in 7 of 8 townships
- **Winds**
 - Adequate, but not stellar
- **Financing**
 - Plan for project financing early 2007

Major Hurdles in 2005 and 2006 That Caused Delay

- **Permit process challenge**
- **Interconnection**
 - MISO performed group study of projects proposed in Thumb
- **Winds**
 - Less wind than originally believed
 - Inconsistent wind reports from “name brand” wind due diligence engineers

Thumb Upgrade Hurdle



- 585 MW proposed by 7 wind projects
- Major delay in MISO completion of upgrade study—finally completed July 2006
- Upgrades required >\$120 MM – prohibitive of any development.
- August 2006, 4 of 7 projects dropped out
- September 2006, revised cost of required upgrades for remaining 3 projects estimated at \$14MM – now manageable cost.

DTE Interconnection Hurdle

- **Small 10.5 MW project interconnection request**
 - Small project wouldn't trigger obligation in DTE/ITC operating agreement requiring transmission upgrade study.
- **Interconnection related agreements**
 - EPC Agreement – build infrastructure
 - Interconnection Agreement – govern interconnection
 - Delivery Service Agreement – pay for wheeling according to commission approved D6 tariff
 - Backup power agreement – deal with plant power requirements
- **The Federal Regulation Problem**
 - Providing transmission service would subject DTE to FERC regulation
 - DTE seeking waiver of “standards of conduct”

Trees at Ground Level vs Trees at Hub Height

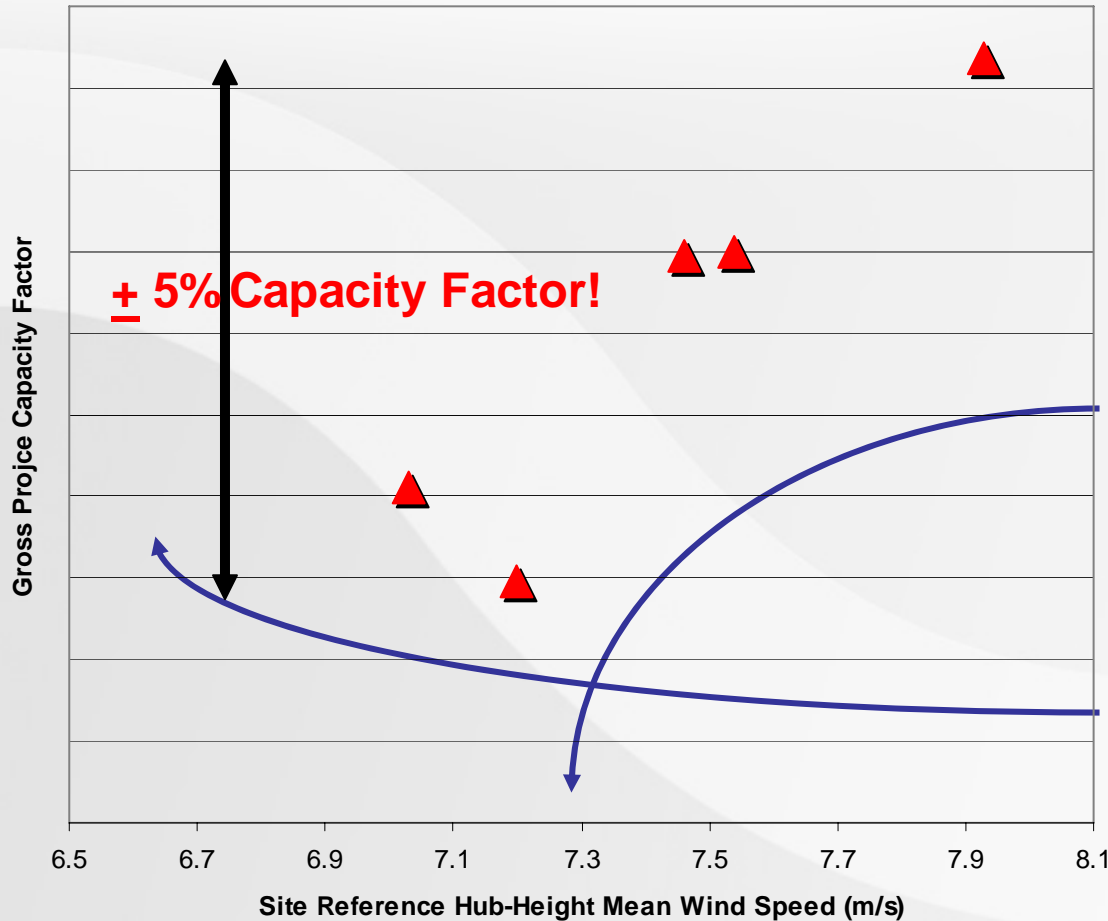


Easy to make subjective assumptions about the effect of trees.

At the height of turbines, the site-scale roughness clearly means something, but what?



Is There a Problem of Energy Estimate Uncertainty?



- Range of estimates for a midwest project prepared by multiple nationally recognized wind consultants

- Reference speed estimates affected by assessment of reference site wind shear and long-term normalization.

- Capacity factor estimates affected by reference site estimate, intra-site variability, and wind shear variations across the site.

Economics Problems

- **Potential economic “hits”**
 - Transmission upgrade and service charges
 - Moderate wind resource
 - Property tax treatment
 - Lack of economy of scale
 - Economy of scale is important in wind in spite of what is commonly thought due to “incremental” nature of wind turbines
 - Price competition in a coal-fired environment

Helpful Improvements The State Could Make

- **Renewable Portfolio Standard**
 - Requirements to grow in sufficiently large increments to allow projects of significant scale to be built at one time
 - Separate RECS from energy –
 - Allow developer to manage sale of physical power separately from sale of RECS.
 - Not require bundling of RECs with energy in PPA.
 - RECS favor in-state resources
- **Distribution System Interconnection**
 - Develop specific tariffs and standards for interconnecting wind at distribution level
- **Treat Wind Turbines as Personal Property for Property Tax**
- **Facilitate offshore wind development**